

Recommendations on a Monitoring Scheme for Polybrominated Diphenyl Ethers (PBDEs) in Puget Sound - Fall 2013

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Introduction

PBDEs are a class of flame retardants that can be persistent, bioaccumulative, and toxic to both humans and wildlife. Phase-out regulations will prevent new PBDEs from being produced, which will help protect the environment from further contamination. However, PBDEs are currently found in a large range of long-lasting products (furniture, electronics, polyurethane foam, etc) and so it is expected that they will continue to be released into the environment.

During fall of 2013, the Environmental Protection Agency convened a sub-group of the Puget Sound Ecosystem Monitoring Program (PSEMP) Toxics Workgroup and one member of the PSEMP Marine Mammals Workgroup to make recommendations on a monitoring scheme for PBDEs in Puget Sound. The PSEMP Toxics and Marine Mammal Workgroups have been engaged in an on-going effort to inventory and prioritize toxics and marine mammalrelated monitoring in the Puget Sound. The Workgroups include participation from scientists and interested parties from many state, local, and federal agencies, as well as from NGOs and the private sector.

The Workgroups engaged with EPA's effort on PBDE monitoring as it aligned well with overall prioritization efforts. The subgroup involved in the PBDE evaluation included representatives from the Washington State Department of Ecology, the National Oceanic and Atmospheric Administration National Marine Fisheries Service, the Washington State Department of Fish and Wildlife, and the Puget Sound Institute at the University of Washington Tacoma. Members of this subgroup consider these PBDE-specific recommendations to be supportive of (but do not necessarily supersede) the overall recommendations reached by the PSEMP Toxics and Marine Mammal Workgroups.

Recommendations

1) Toxics in Fish & Sediment

We strongly recommend maintaining existing long-term monitoring efforts: Chinook and Coho salmon, English Sole, Herring, and sediment.

We support monitoring for the Puget Sound Partnership's Vital Signs/Dashboard Indicators. These include **toxics in fish (Chinook and Coho salmon, English Sole, and Herring)**. The Vital Signs/Dashboard Indicators also includes monitoring of **contaminants in sediment**. Ecology's Marine Sediment Monitoring Team has measured PBDE levels in Puget Sound sediments since 2004. Locations include ten long-term monitoring stations and randomly selected stations from eight monitoring regions and six

urban bays. This recommendation is consistent with the results of the PSEMP Toxics Workgroup overall prioritization effort; both Toxics in Fish and Toxics in Sediments have been identified amongst the highest priority monitoring programs for the Puget Sound.

2) Marine Mammals: Southern Resident Killer Whales and Harbor Seals

Southern Resident Killer Whales are protected under the Endangered Species Act. There is evidence of PBDEs in Southern Resident Killer Whales as well as their main prey Chinook salmon, and they are recognized as a threat to the recovery of the population. We recommend continued PBDE monitoring via NOAA's blubber biopsies and the University of Washington's Center for Conservation Biology's "Causes of Decline Among Southern Resident Killer Whales" program. This recommendation is consistent with the SRKW Recovery Plan.

Harbor seal monitoring is important for food web/bioaccumulation modeling. Harbor seals are a good indicator species because they are abundant and non-migratory and, as a top predator, they consume a variety of prey species. Monitoring toxics in harbor seals, which would include PBDEs, has been identified as one of the highest priority monitoring activities for the Puget Sound by both the PSEMP Toxics Workgroup and the Marine Mammal Workgroup. There is currently no regular monitoring of toxics in marine mammals in Puget Sound.

3) Refine Loading Estimates

According to Ecology and King County's Toxic Loadings Analysis, PBDEs reach Puget Sound via atmospheric deposition (44-56%), Publicly Owned Treatment Works (25-38%), and surface runoff (18%). However, recent data suggests that current (Phase 3) loading estimates may be too low. We recommend additional monitoring to better capture PBDE loadings to Puget Sound.

4) Mussels

We recommend continuing Puget Sound Mussel Watch (part of NOAA's National mussel Watch Program). Mussels are a high quality indicator species for toxics in nearshore areas, which provide site-specific exposure information. The most recent sampling occurred at over 100 sites in 2013 and there are long term records available for multiple contaminants. Monitoring Toxics in Mussels, which would include PBDEs, was selected as one of the PSEMP Toxics Workgroup highest priority monitoring activities for the Puget Sound.

5) Water Column Concentrations

We recommend a one-time sampling event to measure PBDE levels in water column concentrations, with the Strait of Juan de Fuca as the highest priority location, and interior locations in each of the basins and urban bays as next priority. These data would assist in calibrating models of fate, transport, and bioaccumulation.

Participants with the PBDE monitoring scheme:

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